SCIENTIFIC PAPER JSLS

Defining "Laparoscopy" Through Review of Technical Details in *JSLS*

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ABSTRACT

Background and Objectives: The term "laparoscopy" has lost some precision in its definition due to the proliferation in techniques of access to the abdominal cavity. Currently, procedures performed with radical differences in port size, placement, and even need for an extraction incision may be characterized as "laparoscopic." However, the general public and many insurers divide procedures in the simplified categories of laparoscopic or open. Our aim was to characterize the typical laparoscopic operation through review of the technical details of a year's worth of articles in *JSLS*.

Methods: We assembled and analyzed a database of all articles in *JSLS* from 2008-2009 (4 issues starting with Volume 12, #4). For comparison, we also reviewed articles from 1 decade ago (Volume 2). All procedural details were compiled, including means of access, number and size of ports, incision length, and conversion rates.

Results: In the most recent year, there were 81 articles for analysis, compared to 39 in the earlier year. Few articles listed all technical details, as only 58% of reports described mode of access and 56% described the number of ports used. Access was nearly evenly divided between Hasson and Veress techniques. The average number of ports in both study periods was 4, although there was a trend toward smaller port sizes in the current year. Among those studies specifying incision length, the average was 6.1cm in both groups.

Conclusion: The technical operative details are lacking in many reports. Based on review of published studies, most procedures are done with 4 ports, 3 of which are ≥10mm in size. Until there is greater clarity in technical description, the precise definition of laparoscopy will remain elusive.

Key Words: Laparoscopy, Technique.

INTRODUCTION

"Laparoscopy," as a defined term, is the inspection of the peritoneal cavity through the use of a small incision. However, the term "laparoscopy" has lost some precision in its clinical use due to the proliferation in techniques of access to the abdominal cavity. Currently, procedures performed with radical differences in port size, placement, and even what work is accomplished intra- or extracorporeally, may be characterized as "laparoscopic."

There is no consensus among providers, insurers, or the general public as to what constitutes the essential elements of a minimally invasive procedure. Unfortunately, there is the tendency to reduce procedures into the simplified categories of laparoscopic or open. It is important not only as a matter of semantics, as the categorization has ethical implications–are we being honest with our patients when we offer a "minimally invasive procedure" with more ports than our own partner uses? There are also practical implications–what CPT code do we use, and how much reimbursement can we expect?

Given the technological developments that have occurred and continue to occur, we looked to survey the field to help determine what is currently viewed as "laparoscopy."

MATERIALS AND METHODS

Our aim was to characterize the typical laparoscopic operation through review of the technical details of a year's worth of articles in the *Journal of the Society of Laparoendoscopic Surgeons* (*JSLS*). We assembled and analyzed a database of all articles from *JSLS* from the calendar year 2008-2008 (4 issues starting with Volume 12, #4). For comparison, we also reviewed articles from 1 decade ago (Volume 2, all 4 issues).

Recorded elements included first author, specialty, type of article (case report, case series, controlled trial, review,

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DOI: 10.4293/108680811X13022985131895

Table 1.
JSLS Articles, Current Year Versus One Decade Ago

	2008-2009	1998
Articles	110	59
Articles Included in Analysis	81	39
(not endoscopy, editorial, or review article)		
Type		
Case report	42 (52%)	21 (54%)
Series	30 (37%)	18 (46%)
Controlled trial	9 (11%)	0
Specialty		
General Surgery	50 (62%)	36 (92%)
Obstetrics/Gynecology	14 (17%)	0
Bariatrics	4 (5%)	1 (3%)
Thoracic	1 (1%)	1 (3%)
Urology	12 (15%)	1 (3%)

editorial, or basic science paper). Next, we recorded whether the article specifically mentioned laparoscopy, lap-assisted, hand-assisted, or open techniques, or if there was use of robotic assistance. Also noted were technical details: method of access (Hasson, Veress, or optical access), the number of ports, the diameters of the ports, size of the incision made, the rate of conversion to open surgery, and whether intracorporeal or extracorporeal anastomoses were performed.

RESULTS

In 2008-2009 (Volume 12), there were 110 articles published versus 59 published in Volume 2. Review articles, editorials, and those concerning endoscopy were excluded, leaving 81 articles in the current year and 39 articles in Volume 2 for analysis.

Article distribution is outlined in **Table 1**. Approximately, one-half of articles in both cohorts were case reports. A substantial increase in controlled trials was noted in the current year (11% versus 0). Specialty breakdown also reflected a shift toward including more disciplines. In 1998, 92% of articles concerned general surgery, whereas that specialty represented only 62% of articles in the current year.

Technical details are listed in **Table 2**. First listed are articles that included a mode of access. In the current year, only 58% of articles mentioned the mode of access, whereas 41% did in 1998. The specific means of access are

Table 2.
JSLS Articles, Technical Details

	2008-2009	1998
Articles Included in Analysis	81	39
Included Mode of Access	47 (58%)	16 (41%)
Included Number of Ports	50 (56%)	24 (62%)
Average Ports	4.1	3.5
Included Port Size	43 (53%)	21 (54%)
Used 1 or more 10mm	38 (88%)	21 (100%)
Used 2 or more 10mm	25 (58%)	17 (81%)
Used 3 or more 10mm	2 (5%)	10 (48%)
Use of Robot	11 (14%)	0
Included Conversions	9 (11%)	4 (10%)
Average conversion rate	11%	4%

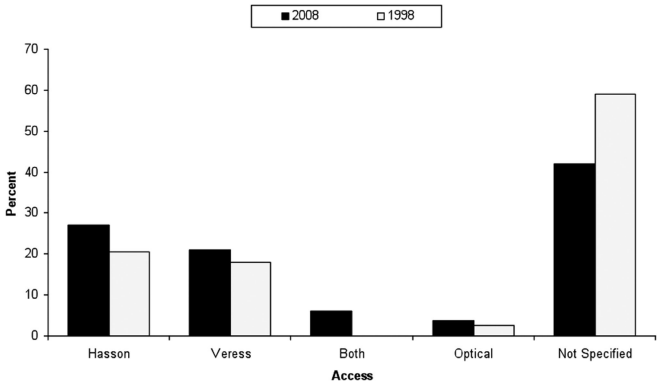

Figure 1. Mode of Access, 2008 versus 1998.

illustrated in **Figure 1**. Of note, the largest category in both time periods was that the means of access was not mentioned in the text of the article.

In 2008-2009, the average number of ports listed was 4.1 ports, and it was 3.5 ports in 1998. When stated, the average incision length was 6.1cm in both groups. Conversion remains an unpopular topic, with approximately 10% of articles discussing specific conversion rates in both samples.

DISCUSSION

Defining laparoscopy is a challenge, with vague boundaries that depend on specialty, procedure, and surgeon. Our aim was to circumvent some of the specific difficulties by reviewing current articles in a multi-disciplinary journal for a sense of what is currently viewed as laparoscopy.

Table 3.
Examples of Options in Approaches to Laparoscopic Cholecystectomy

	Number of Ports	Trocar Diameter
	4	SILS
Maximum Invasiveness	3	12mm
	2	10mm
↑		
	SILS	5mm
Minimum Invasiveness	NOTES	2mm

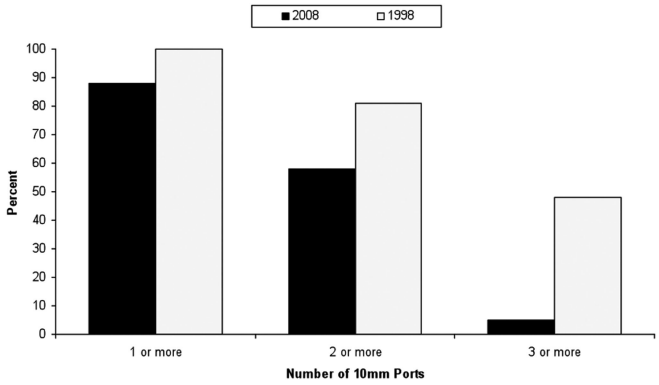

Figure 2. Number of Ports 10mm and Larger, 2008 versus 1998.

Here, it seemed that *JSLS* was uniquely suited to help answer this question.

However, it is also essential to provide some historical perspective. There is the example of the prototypical laparoscopic procedure, gallbladder removal, or laparoscopic cholecystectomy. Circa 1990, the standard operation would be performed with four 10-mm working ports. In 2008-2009, the options are best summarized in table format **(Table 3)**, and it is difficult to characterize precisely what the standard is. There is no doubt, however, that the minimum in invasiveness can no longer be considered the same operation.

In the database of articles, some details reflect advancing technology. Fewer 5-mm instrument types were available in 1998, and this fact is reflected in the increased use of 10-mm ports at that time **(Figure 2**). Of course, perhaps more technically demanding procedures are being attempted today, leading to potential confounding. Similarly, robotic technology is commonly addressed in 2008-2009 but remained on the horizon in 1998.

Other details reflect the maturation of the journal itself. For instance, the overall number of articles published essentially doubled in a comparable time frame. Further, these include a broader array of disciplines and were of higher quality. This is evidenced by the increased number of original articles and controlled trials that were published.

However, there are also some issues that are highlighted by this analysis. Too often, details of technique are left to the imagination of the reader. Something so fundamental as the mode of access was not specified in over 40% of current articles. Perhaps it is irrelevant to the message of the particular article; however, it contributes to the underlying imprecision of what a laparoscopic procedure is. In the same vein, the use of three 5-mm ports may have a dramatic impact over three 12-mm ports in terms of postoperative pain, immediate wound complications, and future hernia formation. Yet only half of articles specifically mention port sizes in their text.

CONCLUSION

The technical operative details are lacking in many reports, which limits our analysis. Based on review of published studies, most procedures are done with 4 ports, 2 of which are 10mm or greater in size. Until there is greater clarity in technical description, the precise definition of laparoscopy will remain elusive.